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COMPLETE SPECIFICATION.

“A Method of Capturing Pure Air and Means for Warming and Distributing same in Insalubrious Centres.”

We GASTON ALBERT CHOPARD, and LUCIEN MAURICE CHOPARD, of 35 Rue Chapon, Paris in the Republic of France. Merchants. do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 The present application for a patent has for object to hygienate insalubrious centres by filling them with pure air, gained in a salubrious spot, such air likewise to be charged with a suitable antiseptic or balsamic substance. Furthermore in heating this air before it is distributed in the required places it can be warmed and thus constitute a powerful heating medium or it may be cooled
10 and will then have a very practical refreshing effect. In order to explain more fully our invention we have attached to this specification a drawing in which Fig. 1. is a sketch of our apparatus. Fig. 2. is a plan of the distribution of warm or cold air in a locality.

Fig. 3 shews a device for giving warning of leakage.

15 In a hygienic spot selected to obtain pure air we establish works in which the air compressor 4 acts by any kind of motive power, pumping the air and forcing it into a pipe 5 from which it can be directed into the tank of antiseptics 6 or into the reservoir 7, or at last into the main pipe 8. The tank for antiseptic fluid consists of a reservoir 6 over which a dome cover 9 can rise and
20 fall the reservoir 6 being filled with the antiseptic or balsamic liquid such as bichloride of mercury, carbolic acid, essence of roses violets pine buds and the like. On arrival at pipe 10 the air coming from the compressor 4 passes through the liquid and rises to the cover 9 and from there goes off through the pipe 11 into the main pipe 8 which has a tap 12 to prevent the air passing directly from
25 the compressor into the pipe 5.

If pure air is sent into the conducting pipe 5 such as that which is supplied by the compressor 4, and tap 13 in tube 10 is turned off and tap 14 of the pipe 15 is opened the air will arrive in the cover 9 without passing through the liquid in the reservoir 6 and pass off as before through the pipe 11 into the main
30 pipe 8 with a slight pressure produced by the cover 9 which acts then simply as reservoir regulator. The air can also be sent direct from compressor 4 by the pipe 5 and for that purpose the taps 14, 13, 11, are turned off and the tap 12 is opened.

If it is desired to send in the main pipe 8 antiseptic or balsamic air under
35 pressure supplied by the compressor 4 the taps 14, 13, 11, are closed as well as tap 16 fitted on the pipe 8 and the taps 12 and 17 are opened, the air passes through the antiseptic or balsamic liquid or solid substance in the reservoir 7 and escapes through the pipe 19 into the main pipe 8. As it is advisable to have a plentiful reserve of air the tap 19 being closed the air coming out of
40 reservoir 7 can be taken through new compressors 20 and kept under a pressure of 100 atmospheres in reservoirs 21, 22, 23, communicating together by the taps 24, 25, and also each of them with the main pipe 8 by the taps 26, 27, 28, In small installations the pumping works would only need to have the compressor 4 and the reservoir 7 the air would then pass into the conducting pipe
45 and be distributed into the required places by appropriate pipes. With regard

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to the remuneration required from the places in which the air is distributed volumetric counters can be used but we prefer the following arrangement.

The air coming from the conductor through the delivery tap is taken into a box on which is a manometer registering apparatus and by measuring the area of the diagram supplied with the manometer registering apparatus and ascer- 5
taining the section of the opening aperture of the box one will obtain the quantity of air delivered. In Figure 2 the whole part *a* is represented as fed with air by this method. Likewise can it be applied to places away from the passage of the main conductor and which nevertheless have need of pure air. 10
For this purpose a joint tap 29 is fitted on the reservoir 21 on which is screwed a small portable reservoir 30 either cylindrical or of any appropriate shape. If one opens the vent 32 and also the taps 33, 34 the air will produce a violent current into the reservoir. If then the vent 32 be closed and the reservoir allowed to fill itself and if when it is full turns off the taps 33, 34 are turned 15
off and the joint tap 29 is disconnected the reservoir being now filled can be transported to any distance and emptied in any place required. The pressure in these small reservoirs can easily attain to 100 atmospheres, but in practice a pressure of 50 atmospheres will be found sufficient. Here also we can supply the air warm or very cold and either the air coming direct from the compressor 4 and having passed directly into the cap 9 or through the reservoir 7 to be 20
charged with the antiseptic or that coming under pressure from the reservoirs 21, 22, 23, which has passed through the apparatus 39 which is composed of a cylinder 39 through which one allows steam of 50 atmospheres to pass by the pipe 47. Several coils of pipes 40, 41, 42, 43, 44, are placed in this cylinder 39. 25

The air arrives from the pipe 8 into the coil 40 which joins the pipe 45 this 25
air can then pass direct into the pipe 46 or run through the other coils, to be heated further. The air having still to go through 3 coils to get the required temperature after having passed through the coil 40 it arrives in the pipe 45.

If the tap 48 is shut and the tap 49 opened the air travels through the coil 41 and arrives in the pipe 45, if the tap 50 is opened, and tap 51 closed the air 30
travels through the coil 42. The taps 52, 53, being open the air will pass direct into the conduct pipe 46 taps 60 and 58 being shut.

It is thus possible to let the air pass through one or several coils by working the taps suitably. The taps placed at the upper extremity of each coil 35
numbered 54, 55, 56, 57, 58, can be taken off and in each case are always to be kept open so that the air contained therein can dilate itself freely the circulation in the coil can only be arranged by the play of the taps 48, 51, 52, 53 of the pipe 45 and through the taps of the lower extremity of the coils numbered 49, 50, 59, 60.

The condensed water vapours can escape through the tap 61 by means of any 40
automatic arrangement. This apparatus 39 is also applicable for sending very cold air for purpose of refreshing appartments factories, schools, hospitals, and the like. For this purpose instead of letting steam arrive in the cylinder a refrigerating liquid such as sulphuric acid ammonia is introduced through a tap 62 and the air is expelled by a compressor furnished with or placed in 45
ice. For the distribution of suitably warm and cold air as required a registering thermometer will denote on the same strips of paper as the manometer the temperature of air in the pipe and not that in the box and one can also ascertain by the diagram what amount of warm air and what of cold air has been consumed. It is evident that if the conducting pipes are of great length it 50
would be necessary to establish secondary stations to receive the air by pressure and in this way the air will not require to be made warm or cool after it has passed through the apparatus 39. Thus in Fig. 2. there is a station 64 which receives the air coming from the station represented by Fig. 1. and distributing it at *a* on arrival and afterwards at *b* with the aid of two pipes one for warm and 55
one for cold air and thus distributes the air in different houses. This station supplies air to another one 68 which with the aid of two pipes will supply the

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warm and cold air. When the pipes are very long and a leakage occurs it would be very difficult to discover such. We therefore fix at every two or three-hundred yards a device serving as a leakage indicator. This device is in the form of a cylindrical body 68 in which move two pistons 69 & 70 fixed on the same rod, the piston 70 can stop the passage 71 the pressure arriving in *f*.

The pistons by gravity or being forced more or less by springs descend and stop the passages 71 72 the piston 69 is provided with a small channel 73 shewn by dotted lines. The air under pressure penetrates through channel 73 under the piston 69 and ends by raising it slightly, the aperture 71 is then slightly opened, the air is conducted into the tube *h* in small quantities and fills that pipe slowly. Once the pipe *h* fills through the pressure the piston is lifted by this pressure and the passage 71 is opened widely, but if a leakage occurs the pressure under the piston not existing any longer the piston descends and the apertures 71, 72 are closed. If the leakage ceases the equilibrium is re-established thanks to the channel 73. When the pistons descend under the influence of a leakage the rod of the pistons which is provided with a steel spring 74 establishes by the action of this spring a contact with a metallic plate 75 detached altogether from the body of the device, which communicates with an electric wire 76 the whole is covered with a cap 77 detached from the other parts. The body of the apparatus being put in the ground one sees that when the pistons are lowered the spring 74 will establish an electric current which will ring an electric bell 78 at the station and thus warned the operator can ascertain by the aid of a measuring instrument such as an ohm-meter which indicates the resistance of the circuit, at what distance the leakage indicator has acted.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A system and apparatus for gathering pure air in a healthy locality and sending it to unhealthy centres the said air being distributed either warm or cold or charged with antiseptics or agreeable odours as herein described and set forth.

2. In procedure such as described in Claim 1 the combination of some kind of air compressor with a dome covered reservoir containing water only or some liquid charged with an antiseptic or hygienic odour or perfume the dome cover serving at the same time as a reservoir and pressure regulator as herein described and set forth.

3. In a system such as described in Claim 1. the combination of an air compressor of any kind with a reservoir which receives the air under pressure and which can contain a liquid antiseptic or some solid substance such as pine buds or the like, as herein described and set forth.

4. In a proceeding such as described in Claims 1, 2, 3, the combination of an air compressor a dome covered reservoir or an ordinary reservoir with an additional air compressor of high power which drawing the air from either reservoir forces it either into the main pipe at a pressure of 5 atmospheres or into other storage reservoirs at a pressure of 100 kilos, for future use and which reservoirs supply it afterwards to the main pipe as required as herein described and set forth.

5. In a system such as described in Claims 1, 2, 3, 4, the combination of an apparatus capable of heating or cooling the air said apparatus being composed of a chamber containing several coils of tube the air being caused to travel through one or several of said coils by the manipulation of a series of taps, steam at 5 atmospheres or more or a congraling liquid being introduced in said chamber for the purpose of heating or cooling the air as herein described and set forth.

6. In a system such as claimed in 1, 2, 3, 4, the combination of a measuring

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apparatus consisting of a box in which the air from the pipe is received, this box being fitted with a registering manometer and a registering thermometer which will indicate by traced diagrams the quantity of warm or cold air consumed in an exact manner as herein described and set forth.

7. In a system as claimed in 1, 2, 3, 4, 5, 6, the combination at intervals of 5 device for indicating leakage as herein described and set forth.

8. An apparatus for indicating leakage of air in the mains consisting of a cylindrical body with passages in which work two pistons which are arranged to stop certain apertures one piston being provided with a channel which permits the air to flow under the other piston and lifts it so as to open one of said 10 apertures, the whole operating to fill the pipes slowly and close both apertures in case of leakage and in that case to establish an electric communication through a steel spring fixed on the rod of the pistons which spring coming in contact with a detached plate fitted with a wire connected to a bell fixed at the station 15 so that the extend of resistance manifested by the current set up will with the aid of an ohmeter indicate at what distance the apparatus has acted.

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Fig.1

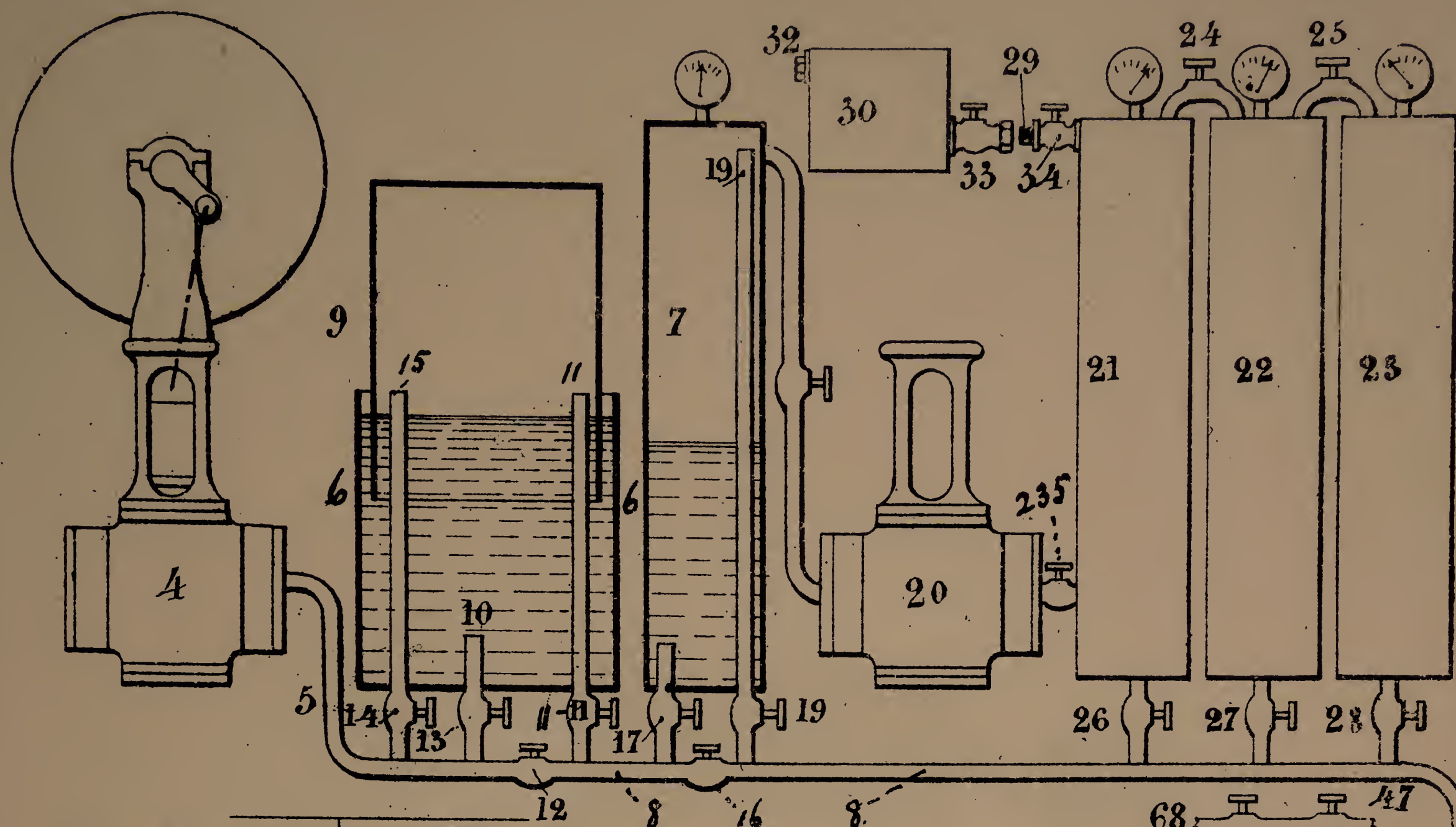


Fig.3

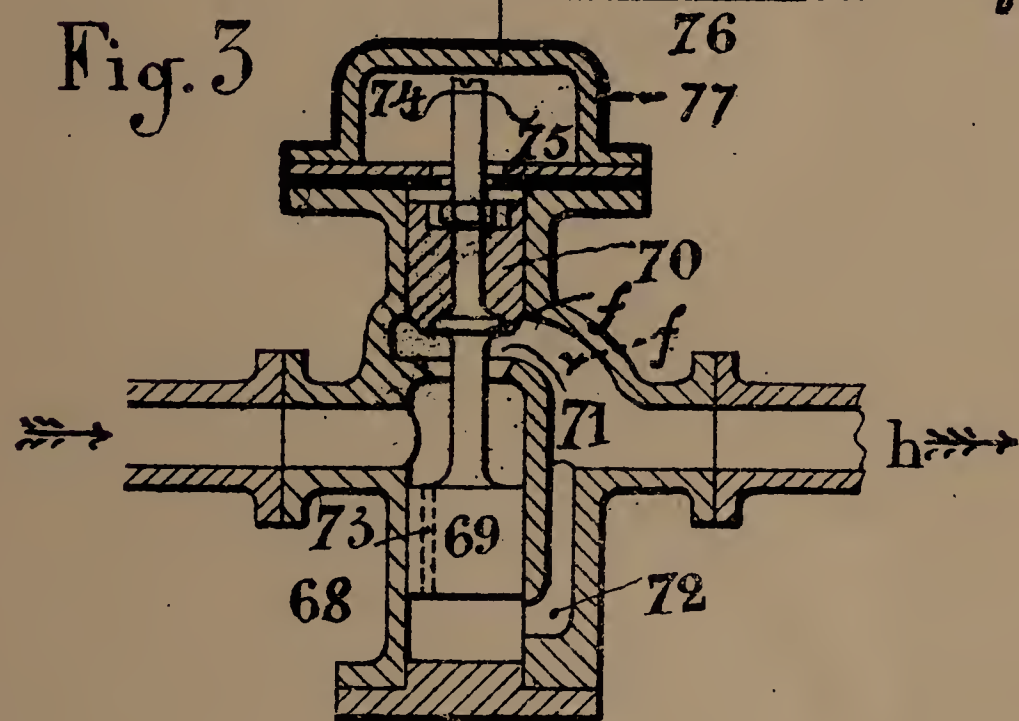
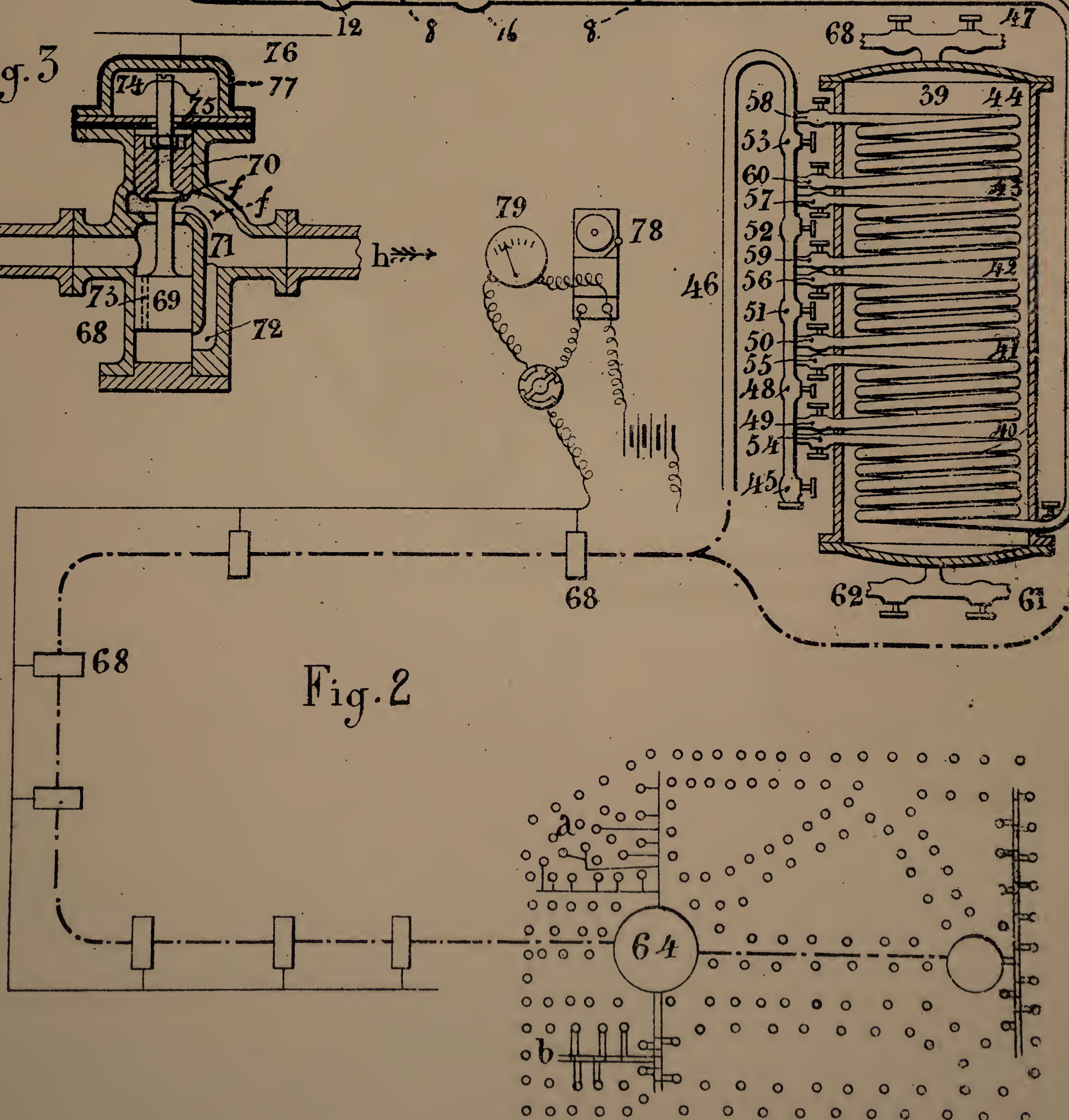


Fig.2



[This Drawing is a reproduction of the Original on a reduced scale.]

